

CLAIMS:

What is claimed is:

1. A traffic management processor for independently throttling the bandwidth of individual traffic flows, comprising:

an instruction decoder having an input to receive a throttle control instruction identifying a flow identification (ID) of a particular traffic flow to be throttled, and having an output to provide a throttle enable signal; and

a departure time calculator (DTC) circuit having an input to receive the throttle enable signal and configured to calculate a departure time for the incoming packet in response to size and bandwidth parameters associated with the incoming packet.

2. The traffic management processor of Claim 1, wherein the DTC circuit is configured to selectively multiply the bandwidth parameter by a bandwidth multiplier factor (BMF) in response to the throttle enable signal to alter the incoming packet's departure time.

3. The traffic management processor of Claim 1, wherein the throttle control instruction further comprises a specified traffic type indicator that indicates which type of traffic is to be throttled.

4. The traffic management processor of Claim 3, wherein the throttle control instruction further comprises a mode signal that can be set to a state that causes the DTC circuit to alter the packet's departure time, regardless of the packet's flow ID or traffic type.

5. The traffic management processor of Claim 1, further comprising:

a departure time table coupled to the DTC circuit and having a plurality of rows, each for storing the departure time of a corresponding packet.

6. A traffic management processor for selectively throttling traffic flows to alleviate network congestion, comprising:

an instruction decoder for receiving a throttle control instruction that specifies which traffic flows are to be throttled, and having an output to provide a throttle enable signal; and

a departure time calculator (DTC) circuit for calculating a departure time for the incoming packet in response to size and bandwidth parameters associated with the incoming packet, the DTC circuit selectively multiplying the bandwidth parameter by a bandwidth multiplier factor (BMF) in response to the throttle enable signal when calculating the departure time.

7. The traffic management processor of Claim 6, wherein each packet includes a flow identification (ID) identifying the packet's traffic flow.

8. The traffic management processor of Claim 6, wherein the throttle control instruction specifies which types of traffic are to be throttled.

9. A method for selectively throttling individual traffic flows, comprising:

receiving an incoming packet including a bandwidth

multiplier factor (BMF) and a flow identification (ID), the flow ID indicating to which traffic flow the incoming packet belongs;

receiving a throttle control instruction specifying which traffic flow is subject to throttling;

determining whether the incoming packet is part of the traffic flow specified by the throttle control instruction; and

selectively delaying transmission of the incoming packet in response to the determining.

10. The method of Claim 9, wherein the determining comprises:

comparing a specified flow ID provided by the throttle control instruction with the flow ID from the incoming packet.

11. The method of Claim 9, wherein the selectively delaying comprises:

receiving packet size and bandwidth parameters for the incoming packet;

selectively multiplying the bandwidth parameter by the BMF in response to the determining; and

calculating a departure time for the incoming packet in response to the size and bandwidth parameters.

12. The method of Claim 9, wherein the throttle control instruction further specifies which types of traffic are subject to throttling.

13. The method of Claim 12, further comprising:

ascertaining whether the incoming packet is of the traffic type specified in the throttle control instruction.

14. The method of Claim 13, wherein the ascertaining comprises:

comparing a traffic type indicator specified by the throttle control instruction with a traffic type indicator corresponding to the incoming packet.

15. A method for selectively throttling any number of traffic flows, comprising:

receiving an incoming packet including a flow identification (ID), the flow ID indicating to which traffic flow the incoming packet belongs;

receiving a throttle control instruction including a specified flow ID indicating which traffic flow is subject to throttling;

comparing the specified flow ID with the incoming packet's flow ID to generate a throttle enable signal; and

selectively delaying transmission of the incoming packet in response to the throttle enable signal.

16. The method of Claim 15, wherein the selectively delaying comprises:

calculating a departure time for the incoming packet in response to size and bandwidth parameters corresponding to the incoming packet, wherein the bandwidth parameter is selectively multiplied by a bandwidth multiplier factor (BMF) in response to the throttle enable signal.

17. The method of Claim 16, wherein the throttle control instruction further specifies which types of traffic are subject to throttling.

18. The method of Claim 17, further comprising:
determining whether the incoming packet is of the traffic
type specified by the throttle control instruction; and
selectively asserting the throttle enable signal in
response to the determining.